M0370043
Task ID# 7039
cc: Mike

Reclamation Cost Estimate

Energy Queen Mine

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DEC 08 2015
Div. of Oil, Gas & Mining

Prepared by
Energy Fuels Resources (USA) Inc.
225 Union Boulevard, Suite 600
Lakewood, CO 80228

December 2015

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1.0 Introduction

The Energy Queen Reclamation cost estimate utilizes reference materials including figures submitted with the Large Mine NOI, 2014 RS Means, Wheeler and Hertz Equipment Rental Costs, and the Caterpillar Performance Handbook, Edition 42 (Cat Handbook) to establish reclamation quantities and unit rates for the tasks described in the reclamation plan. A number of the smaller tasks were estimated on a lump sum basis based on quotes from local contractors or the company's experience on similar sites. Exploration drilling will continue to be bonded separately from the mining operations.

This reclamation cost estimate is designed to quantify the reclamation liability for the Energy Queen Mine

2.0 Reclamation Tasks

The reclamation tasks at the Energy Queen Mine include demolition of structures, grading, and revegetation. The methods used to estimate the reclamation costs for these tasks are described below. Mobilization and demobilization has been determined to have no cost since the Energy Queen Mine is with 50 Miles of Moab, which is the closest Wheeler Cat location.

2.1 Demolition of Structures

Demolition costs for the buildings and other structures are estimated for each mining area. The abandonment of buildings and infrastructure (e.g., culverts, septic systems) are estimated using RS Means, which provides unit costs for these activities based on data collected on similar projects. After finding the unit cost for a specific task, the unit cost is multiplied by the number of units for that activity. Larger items like the backfilling and capping of the ventilation shafts are estimated from the Cat Handbook equipment productivity for that task and the hourly cost to operate the machinery as well as the cost to purchase and install materials.

2.2 Grading

The grading category includes placing stockpiled ore back into the mine, , contouring the development rock areas, and grading the slopes to angles of 3 horizontal to 1 vertical (3H:1V) or less steep. The tasks in the grading category only require two types of equipment, a 1.5 CY Load Haul Dump (LHD) unit and a D-9 Track Dozer. The LHD is used for placing the ore back into the mine as well as placing a seal in the portal. A LHD is required as it is small enough to fit into the portal. The Dozer will be utilized for grading the site in preparation for final soil placement.

The costs for these tasks are based on the quantity of material needed to be moved, the hourly productivity and the hourly operating cost of the equipment selected. The hourly productivity is estimated based on the Cat Handbook, which provides productivity rates for various pieces of equipment at differing operating conditions. The hourly operating costs are based on the equipment hourly rental cost, hourly fuel and maintenance cost and the operator cost. The rental and fuel costs were obtained from Wheeler Equipment Company and Hertz Rental Company. Equipment productivity estimates and hourly equipment costs are summarized in the attachments at the end of this estimate. The operator hourly rate was estimated from Energy Fuels' internal fully burdened wage to its top miners. This rate was increased to account for taxes and profit that would be incurred by an independent contractor.

2.3 Revegetation

The revegetaion category includes (1) ripping the subgrade material in preparation for soil placement, (2) placing a soil cover over the development rock areas, mine yards, access roads, and vent shaft pads, and (3) seeding. The areas that require grading are not expected to be compacted and therefore do not need ripping. The costs for ripping and soil placement are based on the hourly equipment and labor costs and the quantity of material to be moved. A 966 Rubber Tire Loader and D-9 Track Dozer are utilized in the estimate for ripping and soil placement. The cost for seeding is based on a unit cost per area from RS Means multiplied by the quantity of area to be seeded. Access roads leading to the ventilation shafts were constructed prior to reclamation requirements and the reclamation of these roads are not the responsibility of Energy Fuels.

2.4 Project Indirect Costs

The project's indirect costs factors are provided by the Division of Oil, Gas and Mining. These factors were used to calculate the Contingency, Engineering Redesign, Main Office Expense, and project Management Fee. Details of the project indirect costs are shown on the Summary worksheet.

3.0 Summary

Energy Fuels estimates the reclamation cost (in $2020) for the combined Energy Queen Mine is:

- Demolition of Structures – $168,264
- Regrading - $37,890
- Revegetation - $112,862
- Project Indirect Costs – $63,004
- Total – $383,000

A detailed description and reclamation cost estimate is provided for each of the areas in the following attachments.

Energy Queen Mine
Reclamation Cost Workbook

Energy Queen Mine Bonding Calculations

Direct Costs

Demolition of Structures	$168,264	
Regrading	$37,890	
Revegetation	$112,862	
Subtotal Direct Costs	**$319,016**	

Indirect Costs

Mob/Demob	$0	0.0%
Contingency	$15,951	5.0%
Engineering Redesign	$7,975	2.5%
Main Office Expense	$21,693	6.8%
Project Management Fee	$7,975	2.5%
Subtotal	**$53,595**	16.8%

Total Cost 2015	**$372,611**
Escalation (0.5% every year for 5 years)	$9,409
Reclamation Cost Escalated to 2020	$382,020
Bond Amount (rounded to nearest $1,000)	$383,000

Description: Support calculations for the reclamation cost estimate for the Energy Queen Mine

Task 1: Removal of Equipment and Materials

Assumptions

The office trailer and supplies will be sold, salvaged or reused. Cost for removing from the site are for transportation only.
Mobile equipment will be sold from the site at no cost.
The headframe material will be salvaged at no cost after dismantled into shippable sizes.
Number of truck loads are an estimate.
Estimated cost per load = $600

Item	Quantity	Truck Loads
Warehouse and Shop Supplies	N/A	1
Office Materials	N/A	1
Pond Liner	390	3
Mobile Office Trailer	2	2
Fencing	N/A	1
	Total	8

Task 2: Demolition of Concrete Pads

Assumptions

Concrete pads will be broken into manageable pieces and placed within the Waste Rock Area prior to final grading.
RS Means reference 02 41 13 17 5300 was used to estimate the costs. $19.80 per square yard.

Item	Quantity (sf)	Quantity (sy)	RS Means Reference	Unit Cost
Office / Dry (55' x 140')	7,700	856	02 41 13 17 5300	$ 19.80
Compressor House (27' x 50')	1,350	150	02 41 13 17 5300	$ 19.80
Water Treatment Building (21' x 27')	567	63	02 41 13 17 5300	$ 19.80
Aux Hoist House (17' x 21')	357	40	02 41 13 17 5300	$ 19.80

Task 3: Demolish Steel Buildings

Assumptions

Steel Buildings will be disassembled into manageable pieces and placed in the Waste Rock Area prior to final grading.
Lumber, furniture, carpet, and other non metallic debris will be hauled to a local landfill.
Potentially asbestos containing material (ACM) will be removed and hauled to Contract Environmental Solutions.
ACM Removal $3.50/sq.ft. ACM Disposal $0.30/ sq.ft.
RS means reference 13 05 05 50 0550 was used to estimate the costs. $2.81 per square foot.

Item	Quantity (sf)		RS Means Reference	Unit Cost
Office / Dry w/ ACM(55' x 140')	7,700		13 05 05 50 0550	$ 6.61
Compressor House (27' x 50')	1,350		13 05 05 50 0550	$ 2.81
Water Treat. Building w/ ACM (21' x 27')	567		13 05 05 50 0550	$ 6.61
Aux Hoist House (17' x 21')	357		13 05 05 50 0550	$ 2.81

Task 4: Remove Tanks

Assumptions

Steel tanks will be removed from the site. RS means reference 13 05 05 75 0530 was used to estimate the costs. $1,575 per tank.

Item	Quantity		RS Means Reference	Unit Cost
Fuel Tank (EA)	3		13 05 05 75 0530	$ 1,575
Compressed Air Tank (EA)	1		13 05 05 75 0530	$ 1,575

Task 5: Removal of Septic System

Assumptions

The septic tank is a 2,000-gallon precast concrete tank. Broken material will be placed in the Waste Rock Area.
Estimated excavation and backfill for the removal of the septic system is 55 cubic yards.

Item	Quantity		RS Means Reference	Unit Cost
Septic Tank Removal (EA)	1		02 41 13 44 0300	$ 395
Distribution Box (EA)	1		02 41 13 44 1500	$ 57
Leaching Chamber (EA)	1		02 41 13 44 1700	$ 266
Leaching pit (EA)	1		02 41 13 44 2300	$ 495
Excavation and Backfill (CY)	55		31 23 16 42 0305	$ 1.56

Task 6: Removal Pond Liner

Assumptions

Clean and Cut the pond liner into manageable pieces for disposal.
It is estimated that cleaning the pond line will take 2 laborers 1 day.
It is estimated that cutting the pond liner will take 2 laborers 3 days
Each crew member has a cost of $72/hr.
Assumed 8-hour work days.

Item	Quantity		RS Means Reference	Unit Cost
Clean the Liner	2		Estimate	$ 576.00
Cut the Liner	6		Estimate	$ 576.00

Task 7: Dismantle Head Frame

Assumptions

Costs associated with hauling off the head frame steel is accounted for in Removal of Mobile Equipment and Structures.
Crane rental estimated costs of $3,000 per day including an operator.
A crew of 3 in addition to the operator will dismantle the head frame in 10 working days.
Each crew member has a cost of $72/hr.
Assumed 8-hour work days.

Item	Quantity (day)		RS Means Reference	Unit Cost
Dismantle Head Frame Labor	30		Estimate	$ 576.00
Crane Rental (Days)	10		Estimate	$ 3,000.00
Total Unit Cost Per Day	10		Estimate	$ 4,728.00

Task 8: Seal Production and Vent Shafts

Assumptions

The 24-inch thick reinforced concrete cap will be approximately 14-feet in diameter to extend 1-foot past the shaft concrete liner
The 4' diameter ventilation raise will be closed by welding a 1/2" thick steel plate to the top of the vent raise steel liner.

Item	Quantity	Units	Reference	Unit Cost
Install steel formwork capable of holding the 11.4 cy of wet concrete.	1	Each	Estimate	$ 5,000.00
Place 24-inches of reinforced concrete 4 feet below surface (CY)	11.4	CY	Estimate	$ 500.00
Seal 4' vent with steel plate	1	Each	Estimate	$ 500.00

Task 9: Abandon Monitoring Wells

Assumptions

Remove surface protective shroud.
Fill well casing with bentonite material.
Assumes 32 hours of labor to abandon all of the monitoring wells.
Hole Plug Material $7.75 per bag.
Concrete Material $4.10 per bag.
Place surface concrete pug up to 3 feet of the surface.

Item	Well Diameter (in)	Well Depth (ft)	Hole plug required (Bags)	Concrete Required (Bags)
HMW-1	4	30	2.62	2
HMW-2	4	47	4.10	2
HMW-3	4	47	4.10	2
HMW-4	4	48	4.19	2
HMW-5	4	38	3.31	2
MW-1	2	150	3.27	2
MW-2B	2	85	1.85	2
MW-3	2	87	1.90	2
MW-4	2	42	0.92	2
MW-5	2	90	1.96	2
Total			28.22	20.00

Task 10: Site Regrade

Assumptions

Regrading will be accomplished with a D-9 sized dozer or similar.
Regrading volume is based on pushing down the waste rock slope from 2H:1V to 3H:1V along a 1000' length. The height of the slope is approximately 15 feet. The regrade volume is 28 cubic feet per foot of slope length, totaling 1037 cubic yards.
Placing ore back into the shaft will be accomplished with a 966 loader.
Regrading of the water treatment ponds is estimated to take 10 hours with a D-9 dozer.
Average push distances for the Waste Rock Area are 100 feet.
Regrading of the mine yard will be accomplished during subgrade ripping.
Rental costs obtained from Wheeler Machinery Co., Salt Lake City

Item	Quantity (CY)		Reference	Productivity (CY/HR)	Unit Cost
Regrade Development Rock Area	1,037		Cat Handbook	436	$ 0.78
Regrade Ponds	10	Hours			
Place Ore Back in the Shaft	1,177		Cat Handbook	118.5	$ 1.65

Task 11: Gamma Scan

Assumptions

Perform Gamma scan on 50 ft center grid.
Place elevated gamma count material back in the shaft.
Each crew member has a cost of $72/hr.
Assumed 8-hour work days.

Item	Quantity	Units	Reference	Unit Cost
Gamma Scan	4	Days	Estimate	$ 576.00

Task 12: Site Revegetation

Assumptions

Subsoil ripping to 12-inches over 25.6 acres of roads and pads will be accomplished with a D-9 Dozer or similar.
Rental costs obtained from Wheeler Machinery Co., Salt Lake City
Assumed 6-inches of topsoil placement over 25.6 acres
Stockpiled topsoil will be placed with a 966 loader and spread with a D-9 Dozer.
Topsoil placement productivity is based on a 1000-foot haul and estimated cycle time.
Topsoil spreading productivity is based on a 100-foot push.

Item	Quantity		Reference	Productivity (CY/HR)	Unit Cost
Subsoil Ripping BCY	41,301		Cat Handbook	436	$ 0.78
Topsoil placement and spreading LCY	20,651		Cat Handbook	104	$ 2.32
Seeding (Thousand SQ. FT)	1,115		32921 914 0500		$ 29.50

Demolition of Structures	Means Costworks 2012 Reference Number	Unit Cost	Unit	Quantity	Cost
Removal of Equipment and Materials	Estimate	$ 600	EA	8	$ 4,800
Demolition of Concrete Pads	02 41 13 17 5300	$ 19.80	SY	1,108	$ 21,943
Demolition of Buildings	13 05 05 50 0550	$ 6.61	SF	9,974	$ 65,928
Remove Tanks	13 05 05 75 0530	$ 1,575	EA	4	$ 6,300
Remove Septic System	02 41 13 44 0300	$ 1,213	EA	1	$ 1,213
Septic System Excavation	31 23 16 42 0305	$ 1.56	CY	55	$ 86
Remove Pond Liner	Estimate	$ 576	DAY	8	$ 4,608
Dismantle Head Frame	Estimate	$ 4,728.00	DAY	10	$ 47,280
Seal Production Shafts	Estimate	$ 10,698.52	EA	1	$ 10,699
Seal Vent Shaft	Estimate	$ 500.00	EA	1	$ 500
Gamma Scan	Estimate	$ 576.00	DAY	4	$ 2,304
Abandon Monitor Wells	Estimate	$ 2,604.68	Lump Sum	1	$ 2,605
Subtotal					$ 168,264

Regrading	Equipment Used	Hourly Rental Cost	Hourly Operating Cost	Hourly Operator Wage	Total Equip and Op Cost	Quantity	Units	Production Rate	Units	Reference Number	Cost
Regrade the Waste Rock Area	D-9	$ 199	$ 68	$ 72	$ 338	41,956	CY	435.8	CY/hr	Cat Handbook	$ 32,568
Regrade Ponds	D-9	$ 199	$ 68	$ 72	$ 338	10	CY	778	CY/hr	Cat Handbook	$ 3,383
Place Ore Back in the Shaft	966 loader	$ 76	$ 48	$ 72	$ 195	1,177	CY	119	CY/hr	Cat Handbook	$ 1,939
Subtotal											$ 37,890

Revegetation	Equipment Used	Hourly Rental Cost	Hourly Operating Cost	Hourly Operator Wage	Total Equip and Op Cost	Material Cost	Quantity	Units	Production Rate	Units	Reference Number	Cost
Subgrade Ripping	D-9	$ 199	$ 68	$ 72	$ 338		41,301	CY	436	CY/hr	Cat Handbook	$ 32,060
Stage Topsoil In Placement Area	966 Loader	$ 76	$ 48	$ 72	$ 195		20,651	CY	104	CY/hr	Cat Handbook	$ 38,928
Spread Topsoil	D-9	$ 199	$ 68	$ 72	$ 338		20,651	CY	778	CY/hr	Cat Handbook	$ 8,977
Seeding						$ 29.50	1,115	MSF			32921 914 0500	$ 32,897
Subtotal												$112,862

Total **$319,016**

* Hourly rates include overhead and profit
CY - cubic yard
hr - hour

Loader Rental Cost	$ 76
Loader fuel cost per hour	$ 13
Dozer (D-9) Rental Cost	$ 199
D-9 Fuel Cost Per Hour	$ 33
Maintenance Cost Per Hour	$ 35
Operator Fully Burdened Hourly Rate (Includes Taxes and Profit)	$ 72

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MEMORANDUM

To: File cc:

From: Ryan Ellis

Date: 11/20/15

RE: Energy Queen Reclamation Cost Estimate
Equipment Rental Costs

I obtained the current rental rates for the major equipment planned to be used for final reclamation of the Energy Queen Mine from the Wheeler Machinery Co. out of Salt Lake City (801-974-0511). The equipment will be rented on a monthly basis and will be returned individually as the reclamation is completed and not as a group. For example, the haul trucks will only be used for a short period of time in comparison to the D-9 dozer, which will be on site for the duration of reclamation activities. Fuel consumption was also obtained from Wheeler for each piece of equipment but is not included in the rental cost because it is included in the operating cost. The rental and operating cost is assumed to be the same for the 1.5 CY LHD as for the 966 Loader.

D-9 Dozer

Monthly Rental Base Cost:	$	29,000
Required 15% Insurance:	$	4,350
Total Monthly Rental Cost:	$	33,350
Conversion to Hourly Rental Cost		
Work Days Per Month		21
Operation hours per day		8
Hourly Rental Cost	$	199

Hourly Fuel Cost @ 2.50 per gallon = $32.5

966 Loader

Monthly Rental Base Cost:	$	11,100
Required 15% Insurance:	$	1,665
Total Monthly Rental Cost:	$	12,765
Conversion to Hourly Rental Cost		
Work Days Per Month		21
Operation hours per day		8
Hourly Rental Cost	$	76

Hourly Fuel Cost @ 2.50 per gallon = $12.50

12 Yard Haul Truck

Monthly Rental Base Cost:	$	6,000
Conversion to Hourly Rental Cost		
Work Days Per Month		21
Operation hours per day		8
Hourly Rental Cost	$	36

Hourly Fuel Cost @ 2.50 per gallon = $15

Equipment will require 250-hour maintenance service as the reclamation is completed. These maintenance costs are not included in the rental cost, but are added separately. The costs and quantity of maintenance will vary depending on the piece of equipment and the hours operated.

Equipment Productivity Calculations

Wheel Loader (966) Productivity Determination -400' haul			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Distance, FT:		**400**	
Operator Correction Factor	Factor	0.75	
Bucket Capacity (C.Y)		5.00	
Cycle Time (min)		1.58	
Ideal Loader Productivity	LCY/HR	**190.4**	
Adjusted Loader Productivity	LCY/HR	118.5	

Wheel Loader (966) Productivity Determination -500' haul			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Distance, FT:		**500**	
Operator Type		Average	
Operator Correction Factor	Factor	0.75	
Bucket Capacity (C.Y)		5.00	
Cycle Time (min)		1.80	
Ideal Loader Productivity	LCY/HR	**166.4**	
Adjusted Loader Productivity	LCY/HR	103.6	

Wheel Loader (966) Productivity Determination -1,000' haul			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Distance, FT:		**1,000**	
Operator Correction Factor	Factor	0.75	
Bucket Capacity (C.Y)		5.00	
Cycle Time (min)		2.94	
Ideal Loader Productivity	LCY/HR	**102.1**	
Adjusted Loader Productivity	LCY/HR	63.5	

LHD Productivity Determination -400' haul			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Distance, FT:		**400**	
Operator Ability Correction Factor	Factor	0.75	
Bucket Capacity (C.Y)		1.50	
Cycle Time (min)		1.58	
Ideal Loader Productivity	LCY/HR	**57.1**	
Adjusted Loader Productivity	LCY/HR	35.6	

Dozer (D-9) Productivity Determination - 50' Push Distance			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.66**	Assumes 40 minutes/hour
Average Dozing Distance, FT:		**50**	
Work Efficiency	%	66%	
Operator Correction Factor	Factor	0.75	
Ideal Dozer Productivity	LCY/HR	**2,100**	*CAT Handbook*
Adjusted Dozer Productivity	LCY/HR	1039.5	

Dozer (D-9) Productivity Determination - 100' Push Distance			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Dozing Distance, FT:		**100**	
Work Efficiency	%	83%	
Operator Ability Correction Factor	Factor	0.75	
Ideal Dozer Productivity	LCY/HR	**1,250**	*CAT Handbook*
Adjusted Dozer Productivity	LCY/HR	778.1	

Dozer (D-9) Productivity Determination - 200' Push Distance			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Dozing Distance, FT:		**200**	
Work Efficiency	%	83%	
Operator Correction Factor	Factor	0.75	
Ideal Dozer Productivity	LCY/HR	**700**	*CAT Handbook*
Adjusted Dozer Productivity	LCY/HR	435.8	

Dozer (D-9) Productivity Determination - 300' Push Distance			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Average Dozing Distance, FT:		**300**	
Work Efficiency	%	83%	
Operator Ability Correction Factor	Factor	0.75	
Ideal Dozer Productivity	LCY/HR	**500**	*CAT Handbook*
Adjusted Dozer Productivity	LCY/HR	311.3	

Dozer (D-9) Ripping Productivity Determination			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Ripping Depth (FT)		**1**	
Work Efficiency	%	83%	
Operator Correction Factor	Factor	0.75	
Ideal Ripping Productivity	LCY/HR	**700.0**	*CAT Handbook*
Adjusted Ripping Productivity	LCY/HR	435.8	

12 CY Highway Dump Truck Productivity Determination			
Hours per Shift, HR:		**8**	
Work Efficiency, %:		**0.83**	Assumes 50 minutes/hour
Truck Capacity (CY)		**12**	
Work Efficiency	%	83%	
Operator Type		Average	
Operator Correction Factor	Factor	0.75	
Average Haul Distance	Feet	26,400	
Ideal Hauling Productivity	LCY/HR	**36.0**	*Assumes 2 trips per hour*
Adjusted Hauling Productivity	LCY/HR	22.4	

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December 7, 2015

Mr. Paul Baker
State of Utah Department of Natural Resources
Division of Oil, Gas and Mining
1594 West North Temple Suite 1210
Box 145801
Salt Lake City, UT 84114-5801

RE: Submittal of Draft Reclamation Cost Estimates for Redd Block IV Mine (M/037/0046), Energy Queen Mine (M/037/0043) and Daneros Mine (S/037/0121)

Dear Paul:

In response to your letters dated November 3, 2015, Energy Fuels Resources (USA) Inc. (Energy Fuels) is submitting the enclosed draft reclamation cost estimates for the following mines:

- Redd Block IV Mine (M/037/0046)
- Energy Queen Mine (M/037/0043)
- Daneros Mine (S/037/0121)

As a draft submittal, these cost estimates are being sent digitally only. If you would like us to mail you printed copies please let me know to whom and how many.

Please contact Ryan Ellis or me if you or your team have questions during your review of the draft cost estimates.

Sincerely,

Andrea Reither

Andrea Reither
Senior Environmental Specialist

cc: M. Bradley, W. Western (UDOGM), S. Bakken, T. White, R. Ellis (Energy Fuels)